

## The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

- I Evidence obtained from a systematic review of all relevant randomised control trials.
- II Evidence obtained from at least one well designed randomised control trial.
- III Evidence obtained from well-designed controlled trials without randomisation.
- IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series
- V Evidence obtained from systematic reviews of descriptive and qualitative studies
- VI Evidence obtained from single descriptive and qualitative studies
- VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing & healthcare: A guide to best practice (2<sup>nd</sup> ed.)*. Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). *NHMRC levels of evidence and grades for recommendations for developers of guidelines* (2009). Australian Government: NHMRC.  
[http://www.nhmrc.gov.au/files\\_nhmrc/file/guidelines/evidence\\_statement\\_form.pdf](http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/evidence_statement_form.pdf)

OCEBM Levels of Evidence Working Group Oxford (2011). *The Oxford 2011 Levels of Evidence*. Oxford Centre for Evidence-Based Medicine. <http://www.cebm.net/index.aspx?o=1025>

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
<ul style="list-style-type: none"> <li>Charnock, Y and Evans, D. (2001). Nursing management of chest drains: a systematic review. <i>Australian Critical Care</i>. 14(4):156-160</li> </ul>	I	<ul style="list-style-type: none"> <li>Highlights the lack of research on most aspects of the management of patients with chest drains</li> <li>Very little evidence for method of dressing, positioning of drainage unit, clamping of chest drains, patient position &amp; breathing during tube removal.</li> <li>Milking and stripping of chest drains did not make a difference to drain patency or drainage volume in 3 out of 4 studies, no difference in haemodynamic complications in groups that had milking compared to groups with no milking</li> <li>Chest drain removal is very painful and patients require adequate analgesia and preparation time</li> </ul>
<ul style="list-style-type: none"> <li>Curley, M.A. &amp; Moloney-Harmon, P. (2001). <i>Critical care nursing of infants &amp; children</i>. (2nd ed.). Philadelphia: W.B. Saunders Company.</li> </ul>	VII	<ul style="list-style-type: none"> <li>Nursing management of chest drains</li> <li>Troubleshooting of underwater seal drains</li> <li>Avoidance of milking of drains</li> <li>Avoidance of clamping drains</li> <li>Description of the purpose of the 3 chambers of the underwater seal drain</li> </ul>
<ul style="list-style-type: none"> <li>Durai R; Hoque H; and Davies T. (2010). Managing a chest tube and drainage system. <i>AORN Journal</i>. 91(2):275-280</li> </ul>	VII	<ul style="list-style-type: none"> <li>Indication for chest drainage</li> <li>Care for chest drain during transport</li> <li>Positioning of chest drain below level of chest at all times</li> <li>Indications for changing drain</li> <li>Procedure for drain removal, including importance of analgesia</li> <li>Complications of chest drains and nursing management &amp; trouble shooting</li> <li>'Milking' of the chest drain is not recommended due to the high negative pressure &amp; potential tissue damage it causes</li> </ul>
<ul style="list-style-type: none"> <li>Laws, D; Neville, E; &amp; Duffy, J. (2003) BTS guidelines for the insertion of a chest drain. <i>Thorax</i>. 58(suppl1):ii53-ii59.</li> </ul>	VII	<ul style="list-style-type: none"> <li>Indications for chest drainage</li> <li>Securing of chest drains using sutures and a 'omental tag' of tape</li> <li>Danger of clamping chest drains; and ensuring if patient respiratory status deteriorates that the drain is checked to ensure it is unclamped</li> <li>Suction on chest drains depends on reason for chest drain insertion</li> <li>No evidence that disconnecting suction briefly to allow for mobilization is harmful</li> <li>Timing of drain removal during expiration</li> <li>Daily observations required of drain tube</li> </ul>

<ul style="list-style-type: none"> <li>Newcomb, A; Alphonso N; Norgaard M; Cochrane A; Karl T; Brizard C. (2005) High-vacuum drains rival conventional underwater-seal drains after pediatric heart surgery. <i>European Journal of Cardiothoracic Surgery</i>. 27:395-400</li> </ul>	II	<ul style="list-style-type: none"> <li>Randomized controlled trial in children undergoing cardiac surgery comparing underwater seal (UWSD) versus high vacuum drains performed at RCH.</li> <li>Redivac drains were as safe as UWSD, and had lower incidence of residual pleural effusion requiring drainage.</li> <li>Identifies why the majority children at RCH undergoing cardiac surgery have a redivac drain rather than UWSD for their management</li> </ul>
<ul style="list-style-type: none"> <li>Pacharn,P; Hellar,D; Kammen,B; Bryce,T; Reddy,M; Baily,R and Brasch,R. (2002). Are chest radiographs routinely necessary following thoracostomy tube removal? <i>Pediatric Radiology</i>. 32:138-142</li> </ul>	VI	<ul style="list-style-type: none"> <li>Importance of clinical signs and symptoms to identify nearly all patients with significant pneumothorax post chest drain removal in children post cardiac surgery</li> <li>Currently chest x-ray should still be performed post chest drain removal</li> </ul>
<ul style="list-style-type: none"> <li>Tang, A; Velissaris,T; and Weedon,D. (2002). An evidence based approach to drainage of the pleural cavity: evaluation of best practice. <i>Journal of Evaluation in Clinical Practice</i>. 8(3):333-340</li> </ul>	VII	<ul style="list-style-type: none"> <li>Observations and daily assessment required of chest drains</li> <li>Safe positioning of chest drains</li> <li>Danger of clamping chest drains (except during bottle change) including during transport</li> <li>Chest drain removal: timing with respiration &amp; two person procedure with defined roles</li> </ul>
<ul style="list-style-type: none"> <li>Van den Boom J; and Battin B. (2007).Chest radiographs after removal of chest drains in neonates: Clinical benefit or common practice? <i>Archives of Disease in Childhood (Neonatal edition)</i>. 92:46-48</li> </ul>	VI	<ul style="list-style-type: none"> <li>Close clinical monitoring post chest drain removal for infants with a chest drain for pneumothorax identified all clinically relevant pneumothorax</li> <li>In this study no asymptomatic infant had a clinically undetected pneumothorax on chest x-ray</li> </ul>